

Labour students break with union allies

by Ngajo Crequer

A major split appeared this week between Labour Party students and other left-wing groups in the National Union of Students.

The National Organisation of Labour Students (NOLS) has issued an "alternative" development plan for the NUS and accused the union's official plan, agreed at the last NUS conference, of depoliticizing the student movement.

The official plan, outlined in a document called *The Shape of Things to Come*, proposed a reduction in the union's activities and

concentration on problems directly concerning NUS members. The NOLS document argues instead that the NUS should retain a broad conception of its political role and base its strategy on strong ideological foundations.

The NOLS document says that the NUS continually needs to review its priorities but says that there is not a narrow or autonomous view of student interests. "The consideration of wider social and political factors" are "crucial to the establishment of priorities in student organizations," and current NUS plans reflect problems rather than overcome them, argues NOLS.

NUS should seek to rejuvenate

its role and actively involve students in its campaigns, it says. There could be no division between "general issues" and "issues affecting students". Without an overall political view ability to form alliances with allies was damaged and the internal strength of the union was lessened, it says.

NOLS says that the analysis in the NUS document "weakened its ability to lobby and ideology in diplomacy. It seeks to act only within the parameters of the current ideological framework, not to change them."

NOLS wants to see a long-term commitment to central funding of

the area structure which is involved in union development, representation, campaigning, services and communication, and a militant form of policy of partial central funding by means of a levy of subscriptions. The NOLS document doubts that the current reorganization of the administration of the NUS can save the money it is intended to. In the next year the student movement must decide how it rates the NUS. NOLS. It may well have to claim a larger share of diminishing resources if the student movement is to survive. And that also means that it must go on the political offensive.

'Adapt for industry' urges MP

Scottish Education Minister Mr Alex Fletcher has called for closer links between education and industry.

Opening a seminar on "education for the industrial society" at Forthhill College of Education, Mr Fletcher said it was crucial that cooperation between academics and industrialists be revitalized and strengthened.

"Many companies lack the resources or expertise needed to exploit new ideas quickly and efficiently. Conversely the research and development facilities within academic institutions can develop and benefit from sponsored work for industry," he said.

The quality of life of the community was ultimately dependent

on the country's industrial base, said Mr Fletcher. There had to be improved attitudes towards the manufacturing industry in particular among all those involved with the education system.

"The task we are now embarked on, through the education for the industrial society project, is to define the needs of the industrial society we have and are likely to have, and to adapt education to those needs," said Mr Fletcher.

"Our aim is to prepare pupils, both at school and in further education, to live and work in an industrial society by providing them with knowledge and understanding of industry. By making them to make their own contribution to our future by working in industry."

Learned societies 'losing competitive edge' warning

Learned societies need to adopt a more commercial approach in competition with other organizations as retailers of scholarly information, Mr J. F. Rowland, scientific officer of the Royal Society told an audience of librarians and information scientists last week.

Mr Rowland was speaking at a joint conference in London on the worldwide provision of information organized by Aslib, the Institute of Information Scientists and the Library Association.

He warned that if learned societies, such as the Royal Society, became more commercial their distinctive character as voluntary and co-operative organizations of scholars must be maintained. "This will be a difficult tightrope to walk," he said.

One of the reasons why learned societies had suffered from competition in recent years was their basic unwillingness to adapt quickly to rapidly changing circumstances. This had been compounded by an overcautious attitude and an inability to commit substantial investment capital to projects, said Mr Rowland.

He warned that there was a danger that learned societies could be left with no role except that of a professional institution if they completely lost their information activity.

which had already been much eroded over the past 35 years.

Fortunately their role as major retailers of the goodwill of scholars who would resist a complete takeover from commercial publishers, he said. The societies also had a continuing part to play in the dissemination of learned journals and the maintenance of standards.

Professor A. J. Evans of Loughborough University said that results of a survey carried out among polytechnics and universities showed that academic libraries were only used by outside bodies when a system had been clearly set up to meet a need and not as a direct result of an institution's so-called positive policy.

His survey showed that 69 out of a total of 91 institutions which replied spent less than 500 staff hours on outside information provision, yet half of these said they maintained a positive policy.

Greater use of academic libraries by outside institutions was made when funds were made available in the case of the medical libraries at the universities of Leicester, Oxford, Cork, Southampton and to a lesser extent Newcastle, Nottingham and Edinburgh, all of which received financial help from the National Health Service.

Nalgo worries over pace of pay talks

by David Johnson

Senior officials of the National Local Government Officers' Association are increasingly worried at the "Clegg" report on pay which will be delayed until the New Year.

The union's national committee is meeting today to review the pace of development and is likely to discuss recommending its attitude in the Clegg case if it is not resolved by the end of the year.

Meanwhile efforts are being made to bring forward from mid-October the suggested date for Nalgo to present its own evidence to the commission. One complication is the commission's new chairman, Professor Sir John Wood, who is chairing the teachers' and lecturers' arbitrators, last year.

The reference is regarded as at least of the three outstanding reports. The prime minister has been given to understand that the commission will be finishing work around the end of this year and early part of next.

Commission officials say it is unlikely that the incoming chairman will be able to get things moving any faster.

The university clerical staff accepted an interim award of 10 per cent in return for the reference date of the Clegg study being shifted from July 1979 to July 1980. The award is 20 per cent and a number of additional improvements.

Meanwhile clerical staff in colleges and polytechnics whose pay is tied to local government rates are awaiting an arbitration report designed to reconcile their 21 per cent 1979-80 pay claim with a 13 per cent offer of 13 per cent.

Dolegates representing university technicians were meeting in London yesterday following rejection of their negotiators of the employer's latest pay offer.

North American News

Georgia Professor chooses jail rather than tell judge how he voted on tenure decision

Government investigates university discrimination

University of Georgia Education Professor James Dinnan has been in prison since July, when he was jailed for contempt of court after refusing to tell a judge how he voted on a tenure decision.

The University of California at Berkeley stands to lose \$25 million worth of federal contracts from next month, unless it hands confidential faculty employment records over to government investigators who are checking the campus's performance in recruiting women and racial minorities.

The Berkeley and Georgia cases are the most visible manifestations of a new wave of resentment about government-mandated "affirmative action".

All American academics are aware of the implications of affirmative action, but there is no simple, generally accepted definition of the term.

For example the university of Pennsylvania's affirmative action plan states: "It shall be the policy of the university to fill administrative and professional positions with special consideration to women and minority persons where all other relevant qualifications are equal." The plan explains that the policy is designed to ensure "that the university has an effective and heterogeneous work force".

However no brief definition can give an idea of the cumbersome administrative machinery that has come into existence to monitor and enforce affirmative action. Indeed many academics have lost sight of the policy's laudable intention—to make up for the discrimination suffered by women and minorities over many generations—and they focus instead on the adverse consequences of its implementation. In particular they worry about the inevitable intrusion of Federal investigators and courts into academic decision-making processes that have traditionally been confidential and the loss of the government or the judiciary.

An overwhelming majority of faculty members at the University of Georgia support the stand taken by their fellow colleagues, Professor Dinnan, who was one of a nine-member faculty committee that voted 6-3 in a secret ballot last year against giving tenure to Matja Blaubeurg, an assistant professor of educational psychology.

Miss Blaubeurg, who had also been denied tenure the two previous years, was told that her contract would not be renewed. She responded by suing the University of Georgia on the grounds that she was rejected because of her sex and especially because of her activities as director of the university's Small Women's Studies Programme.

In order to collect evidence for her case, Miss Blaubeurg's lawyer asked for depositions from the six members of the Tenure Committee who were believed to have voted against her. Five agreed reluctantly to say how they had voted, and Dinnan refused.

When Federal Judge Wilbur Owens ordered him to cooperate, Professor Dinnan chose to defy the

court, maintaining that his vote was his own business. Eventually the judge fined him \$3,000 for contempt of court and sent him to jail for three months. The 50-year-old professor surrendered to Federal marshals in his academic robes, telling reporters they showed him "in effect the Federal Government will be locking up the University of Georgia".

Professor Dinnan is due to come before Judge Owens again on October 3. As he still remains silent about his vote, he could be sent back to prison for another 18 months. But the United States Court of Appeals in New Orleans has agreed to an "expedited hearing" of his appeal, and the case should soon be taken out of Judge Owens' hands.

A University of Georgia spokesman said that, while Professor Dinnan has been serving time in the minimum-security prison at Eglin Air Force base, Florida, support for him has been running high. The faculty have filed several petitions on his behalf and raised money to pay off his fine. They believe that a fair and effective system of academic freedom and promotion depends on the confidential evaluation of candidates.

However, Miss Blaubeurg's lawyer maintains that university policy must give way to the demands of the law. "It is impossible to act against discrimination without penetrating the traditional veil of academic secrecy," he said.

Confidentiality versus affirmative action is also the central issue in the dispute at Berkeley. It is less glamorous than the Dinnan case, because there are no personalities to act as martyr, hero or villain, but its implications are just as important.

The United States Secretary of Labour, Roy Marshall, has given the University of California at Berkeley one month to allow his civil rights investigators to copy its faculty employment records. Otherwise, he says, the campus will lose its government contracts which are worth \$25 million.

Berkeley Chancellor Michael Heyman called the decision "an extreme response to a disagreement over procedural aspects of a Federal affirmative action investigation". He indicated that the university would probably seek a Federal court to overrule the secretary's order, although it might be prepared to comply if the Department of Labour could give sufficient guarantees that the campus would be kept secret.

The dispute dates back to March 1978, when Federal investigators began a thorough routine review of faculty recruitment and promotion at Berkeley, to check that the campus was giving a fair opportunity to women and minorities. They thought the case would be enough to win over members of the Senate



White male staff are more likely to be promoted and to receive higher salaries than women and blacks on many American campuses.

New aid deal for students

Congressional negotiators have agreed on a second slightly cheaper package of Federal higher education programmes to replace the earlier compromise which the Senate rejected as too expensive.

The main change is to raise the interest rate for guaranteed student loans after graduation from the present 7 per cent to 9 per cent. The first compromise produced by the House-Senate Conference Committee had put the rate up only to 8 per cent.

"We were sorry the interest rate had to go up to 9 per cent," said Steve Laffan, National Director of the Coalition of Independent Colleges and University Students. Other higher education lobbyists also remained enthusiastic about the re-authorizing legislation.

One possible change the House-Senate Conference Committee had made was to require students to pay back accrued interest on

guaranteed loans for the period they were of college. That was an amendment included in the original Senate version of the Bill, which was adamantly opposed by the House and by the higher education associations.

Under the new compromise, the interest rate on guaranteed student loans would drop from 9 to 8 per cent if there is a general fall in interest rates.

The rate for the Government's other loan programme, the National Direct Student Loan (NDSL), will rise from 3 to 4 per cent, as agreed previously. But the grace period before repayment begins has been cut from nine to six months after graduation. The NDSL is a means-tested programme aimed at poorer students, while the GSL is open to everyone regardless of wealth.

Budget Committee, who were luxurious in defunding the earlier, costlier bill.

The Senate was expected to vote on the second conference agreement this week. President Carter could then sign the Bill into law before authorisation for the government's higher education programme runs out at the end of this month.

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Overseas continued

CANADA

THE CANADIAN INSTITUTE UNIVERSITY OF CALGARY VICTORY POST-DOCTORAL FELLOWSHIP

The Calgary Institute for the Humanities is offering a post-doctoral fellowship to a scholar in the field of Canadian literature, history, or culture. The fellowship is for a period of 12 months, starting in September 1981, and is open to applicants from any country.

The university of the following to provide an opportunity for a scholar to conduct research in the field of Canadian literature, history, or culture. The fellowship is for a period of 12 months, starting in September 1981, and is open to applicants from any country.

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UNIVERSITY OF NATAL Department of English Durban

Applications are invited from suitably qualified persons, regardless of sex, religion, race, colour or social origin for appointment to the post of

PROFESSOR

The vacancy arises from the establishment of a second professorship in the Department of English. The successful candidate will be responsible for the teaching and supervision of students in the Department of English. The salary for this post is R17,100 - R20,100 per annum.

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Lady Plowden takes over

Lady Bridget Plowden has been elected president of the National Institute of Adult Education for the next three years. She will take up her post in January, when she gives up her present role as chairman of the Independent Broadcasting Authority.

Vice-presidents of the institute will be Dame Rosemary Murray, president of Now Hell at Cambridge University and Professor Harold Wilshire, emeritus professor of education at Nottingham University.

Executive chairman will be Professor H. A. Jones, pro-vice-chancellor at Leicester University and Mr J. Rendel Jones, former chief education officer for West Sussex, will be honorary treasurer.



Evening class fees rise reduced

Humborside local education authority has been forced to reduce recently imposed 400 per cent rise in non-vocational evening class fees following a drastic drop in numbers.

Humborside gained a reputation for its evening classes, offering a wide range of subjects from art to music. The authority has now decided to reduce the fees to a more reasonable level.

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Principal wins fight to save college

by Charlotte Barry

The principal of a short-staffed dental college, which was due to close this month, has succeeded in his last-ditch personal campaign to save it.

Mr John Seal, principal of Rulph College (formerly Battle of Britain House), is to make history by taking over the adult education college and running it as a private, non-profit making enterprise.

Earlier this year the Outer London borough of Kingston, which has been running the college at an annual cost of £50,000, decided to close it as part of its programme of spending cuts.

Rather than be redeployed within the education service, Mr Seal offered to run the college privately and pay the borough an agreed annual rent for the building during the next 12 years until he retires.

This week Mr Seal said he was delighted with the borough's decision to collect to contract to be taking it over, he said. "We are hoping that everybody will all right and happy to see going ahead by January."

Until this month the college catered for about 1,800 people a year on courses lasting between one day and two weeks. Over the past seven years Mr Seal has expanded the traditional liberal studies programme to include industrial relations and pre-retirement courses.

In the absence of a local authority grant he expects to run more income-generating courses for trade unions, companies and industry and to revert to the college's former aims.

At the same time there has been a new development in the threat hanging over two further short-term colleges in Staffordshire. Pendrell Hall and Wedgwood Memorial College have now been asked to consider remaining open on a self-financing basis.

Both colleges were on a list of suggested closures drawn up over the summer by Staffordshire County Council's budget panel, which ordered a 5 per cent cut in the 1980-81 education budget.

Pendrell Hall already closed about 80 per cent of its courses in 1979. At Wedgwood Memorial College the principal has been asked to consider a 50 per cent cut in the annual budget of £100,000. 60 per cent comes from local education authority.

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Sex bias getting worse says national education body

The salary and equality gap between women and men has widened over the past year, according to the United States Government's National Centre for Education Statistics (NCES).

The NCES reports that at every academic rank and in every type of institution, men were not only paid more than women but also received a larger average increase in salary last year. Its analysis is based on 2,245 colleges and universities.

More surprisingly, the NCES found that the number of women increased somewhat in all academic ranks, although female representation is still weighted heavily towards the bottom of the faculty ladder.

The average salary increase for men last year was 7.2 per cent. As the American Association of University Professors pointed out when it released the salary survey in June, that represents a real decline of 5 or 6 per cent because of inflation.

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Fellowship award

The Wellcome visiting professorship in physiology at the Millroo Harbrey Medical Center, Pennsylvania State University, has been awarded to Professor P. J. Rendle, fellow of Harford College and head of the Nuffield department of clinical biochemistry and professor of clinical biochemistry, University of Oxford.

Clive Cookson, North American Editor, The Times Higher Education Supplement, has been awarded a National Press Building, Washington DC 20045, Room 541, Telephone: (202) 638 6765.

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There must be greater emphasis on the manufacturing technology and on management education, the fields in which Britain is "lagging behind its competitors". The Liberals are calling for a "new regard for commerce and industry."

هَذَا مِنْ الْقُرْآنِ

The UN university looks at the deepening North-South split and tries to find some solutions

The rector who sees a future in unity

This year is a "watershed" for the United Nations University. In December its medium term plan is to be discussed by the new council. There are signs that Dr K. Soedjatmoko, its new rector, intends the university work to reflect its original role as the intellectual arm of the UN more closely than was possible in the first five years. This will mean a greater emphasis on finding global solutions on the lines of the Brandt Commission report. Mr Soedjatmoko, who is regarded as Asia's leading intellectual, has received the Rana Magsaysay award for intellectual understanding. He was Indonesia's ambassador to the USA between 1965-1974 and then became adviser for social and cultural affairs to the National Development Planning Agency of Indonesia.

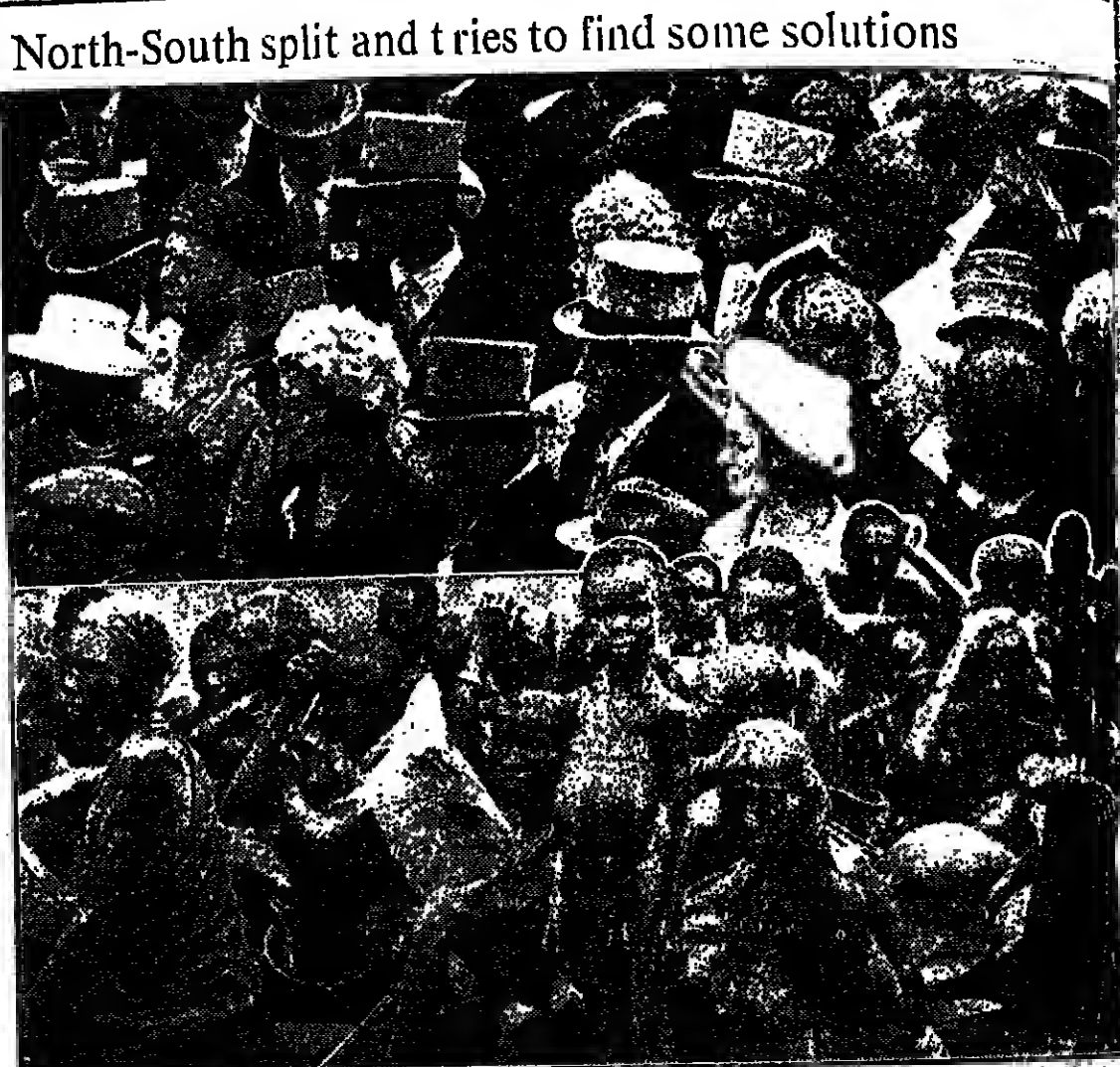
However he pointed out that the expansion of knowledge in the last decade had not added to our capacity of solving the most urgent problems facing humanity.

"This has been partly due to a lack of political will, but also very often our knowledge has been irrelevant to those problems," he said. He felt the UNU, along with the world's universities and research centres, must help build the knowledge and skills required to answer questions such as how to overcome world hunger, alleviate human suffering and misery, reduce aggression and violence and prevent irreversible damage to our ecosystem.

Dr Soedjatmoko believes these questions can be answered by the UNU as well as other universities, and that together they can remedy certain weaknesses in science and technology.

For example, the university could encourage scholars to collaborate in research and advanced training and check the fragmentation of the world's scientific communities.

"Together, the university's institutions can break the intellectual isolation of scientists and scholars in the developing countries from each other and also from their colleagues in the industrialized countries and help reverse the brain drain," he said.



Three-quarters of the world does not get enough to eat despite man's advanced technology and ability to produce enormous quantities of food.

Academics can help fight poverty too

The United Nations University's social and cultural project is seen by Dr Abdel Malek, the project coordinator, as central to the whole of the UNU debate. Its origin lies in the deadlock of the second development decade of the 1970s when it was felt that the whole direction of development was wrong.

"Something was lacking and our project was designed to give flesh to a philosophical conception and scientific approach which considered that the whole problem with development was its Western orientation. Our mission was to outline the major civilizational and geographical and cultural regions were historically separate," says Dr Abdel Malek.

He stresses that the project, which now has 21 associated units consisting of around 300 scholars in 50 countries, is not a third world or a global project, dealing with the human condition. (The latest to join is Dr Joseph Nadehem of Cambridge University's East Asia History Library.) It is open-ended, because the vision of the project is conceived of as an intellectual and scientific

workshop, encompassing all different cultural aspects.

"We are trying to see the different positions of social evolution in a cultural context. We are looking at approaches in the Western world which can be useful to other societies and allow resources to be used," he says.

Dr Abdel Malek admits that no intellectual project can solve man's problems alone, but he believes it can help by highlighting difficulties and pointing to hidden potentials. "We can do this by asking various questions of thought to outline the possible scenarios. If we played the game of left and right or black and white, we would not get anywhere. Our purpose is to work as a team," he points out.

He says that they are only concerned with concrete problems. For this reason they plan to have more people involved with aesthetics, religion and art. "This will involve tapping the resources of religious and philosophical thinkers, writers, musicians, film makers and geographers. Next year we are planning a series of activities to open

up these parallel groups, which will broaden the entire scope of the project," he says.

The project, which is funded for five years and coordinated from the Centre Nationale de la Recherche Scientifique in Paris, with the help of the Maison des Sciences de l'Homme, will end in 1982.

At the end of that year it is hoped to present a written report of major social and cultural approaches; which will be based partly on the work done by members studying different aspects such as culture and thought, philosophy and religion, and history and international relations. It will also include conclusions reached by other members of the sub-project on Endogenous Intellectual Creativity, whose next regional seminar is to be held in Kuwait next month.

"Our report will not be a series of recipes. It will be a well-balanced series of scenarios outlining the potential courses of evolution in society. It will be designed to contribute to a deep understanding of the human condition," Dr Abdel Malek says.

Civilization has reached crisis point, says economist

Man had achieved unlimited power to destroy his planet, yet is unable to solve the world's major problems, Professor Celso Furtado, professor of political economy at the Escola de Hautes Etudes en Sciences Sociales at the University of Rio de Janeiro said in his keynote speech.

"We are at a very critical period of civilization and we badly need to think globally," he said. "In any discussion of the transformation of the world, we have to examine the role of technology in our society, and how it had become a dominating force over men."

The arms race was an example of technology's domination of our society. Countries like France had two-thirds of their resources linked to arms and 50 per cent of the technology we used was a by-product of the arms race.

"There are four pounds of TNT per person and that is a frightening power of destruction. If we are going to change the world, we have to start with the question of arms and weapons," Professor Furtado said.

Changing the world was very much a question of becoming aware of what we might pass on to our children and grandchildren.

Speaking on changing patterns in the world economy, Professor Emmanuel Wallerstein, director of the Fernand Braudel Centre in New York, said that the capitalist world economy had entered a long crisis comparable to that which faced feudalism between 1300 to 1450.

The fact that we were in a systemic crisis did not mean that the capitalist development of the world economy would come to an end. On the contrary, the very vigour was fuelling the crisis and continued to be the main factor in exacerbating the contradictions of the system.

He pointed out that there were three different logics playing themselves out in the crisis. One was the logic of socialism, the second the logic of domination and the third that of the civilizing project. He implied a change of emphasis in the university's work during the next five years which would be dedicated towards finding global solutions to urgent problems.

"This might mean policies leading to nuclear war and not bringing about the demise of a present system in a manner which destroys much of the forces of production and thereby making socialist world order far less truly feasible," Professor Wallerstein said.

In the section on the scientific technological revolution and its impact on urban and rural societies, Professor Jannis Golembiewski, specialist in political and social problems in Poland, said that the main question in assessing technology was whether this problem humanizing technology had been resolved or whether it was being developed as a new instrument of domination.

He pointed out that, in technology the means of social control and manipulation, an open and general debate with the participation of numerous masses was needed. "One should select values and styles of dialogue so that the interested individual representative of his or her knowledge and experience can have the opportunity to participate in the process of decision-making," he said. "Otherwise there was a danger that, based on public opinion, supported by the knowledge of experts, there would appear an elite assessment of the technology using specialist knowledge to criticize the creators of technology and politicians and by reinforcing the process of domination."

In a talk on youth, sex and the family Dr Zineb Toghiani, the Iranian delegate, provided an insight into her country's recent revolution and its future.

Dr Toghiani pointed out that a birthrate to Iran had led to a proportion of young people in the population that was a world record. This meant the characteristics of one generation of today will be passed on to the whole population of the future.

She said that the youth had had very different aspirations. Those before the revolution, who were the children of the bourgeoisie, had been educated in the West and had become converts to imperialism and the capitalist system.

The only way to obtain an education was to go to the West. The only way of life of Iran had been through the ideological and religious values of the West. The young people had been attracted to the West and had been converted to the West. The young people had been converted to the West. The young people had been converted to the West.

Tradition still holds sway at St Hilda's

The abbess who gave her name to St Hilda's College, Oxford, presided over a mixed monastery in Whitby, Yorkshire, during the middle of the seventh century (she died in 800). It is ironic that St Hilda's remains one of four single-sex colleges in the university.

There are of course strong arguments on both sides and the question of "going mixed" has been keenly debated every few years during the last decade within the governing body the senior common room; it has found itself almost evenly divided. Under the 1923 Oxford and Cambridge Act a two-thirds majority is needed to change a college's statutes.

Those done in favour of going mixed, particularly at the fellow-student level, like St Hugh's, argue that the college is losing out both financially and academically.

The college has recently lost two academics in organic chemistry and in English literature, almost entirely funded by the university through attached to the college because of its policy to restrict fellowships to women. The posts are advertised by the university and filled on merit; if men are appointed they cannot be attached to St Hilda's. The loss is estimated at some £100,000.

At the undergraduate level applications have also been falling and though standards have not suffered, certain subjects, in particular maths, have suffered more noticeably. Many dons are now pressing hard for the fellowships to go mixed to reverse the image of the college, founded, as an official statement says, "in 1883, at Cheltenham College in 1883."

Many dons would also like the college to go mixed or undegraduate level. But, interestingly, the Junior Common Room which centred on women students in 1974 was in 1975 now has mixed views. Some students are seeing the college as a feminist stronghold, others as a traditionalist one.

Among the dons there is a strong traditionalist or conservative lobby against going mixed. They argue that the college has built up an identity over the years, which some students see as a feminist stronghold, others as a traditionalist one. They argue that the college has built up an identity over the years, which some students see as a feminist stronghold, others as a traditionalist one.

Earlier this year St Hilda's launched an appeal for £500,000 to fund more scholarships, a sure way to attract high calibre candidates to the college. The college has a new principal, Mrs Mary Moore, who is understandably reluctant to comment on the issue.

Leaders

Paul Flather looks at the effect of co-residential colleges on the academic and social atmosphere at Oxford and Cambridge

The mixed marriage that was born of meritocracy

Oxford and Cambridge have been coeducational universities for more than 100 years. But only in the past decade have the universities become co-residential. The result has been a huge increase in the number of women going up to the universities, well above the 20 per cent level demanded by the Franks Report in 1966.

There are now as many places open to women as men at Oxford, and the proportion of women undergraduates at the university is almost exactly the national average in universities, 37 per cent. At Cambridge the figure is about 25 per cent; 10 years ago it was just under 12 per cent.

When it came, the mixed college led to very few of the "problems" of social and academic life that had been predicted. The rowing colleges did not suddenly lose muscle power, as St Catharine's, Cambridge, which was mixed last year, might testify. Most undergraduates at St Hilda's at Oxford can best be described as "bored" by looking beyond the four walls of the college quad or courtyard, or more obviously not turning up for breakfast.

Mixed colleges may have become more "inclusive" because social life could now be self-contained, but never completely so; and students were not so much distracted from work but encouraged to do more, by the example, in particular of harder working women students.

Almost without exception the myths of "tolled life" have not materialised; or if so have proved harmless. Some colleges went at it with a flourish (Queens', Cambridge regrettably held a strip-tease last June in spite of strong protest to mark the end of 522 years of admitting only men) but most have accepted the advantages of going "mixed". It was not so much as an altruistic gesture to help the cause of women, though this was obviously an important factor, but more a desire to raise academic standards by going after the best candidates, irrespective of sex.

Now the spotlight has been thrown on those undergraduate colleges which have chosen to remain single-sex. There are four colleges at Oxford, three women's and one

men's and seven at Cambridge, five men's and two women's.

Broadly there seem to be two strands of argument, often overlapping and often put forward in the same senior common room, in favour of remaining single-sex: a traditional strand arguing the status quo, for example Oriel at Oxford, and Peterhouse at Cambridge; and a progressive strand arguing for greater choice for students and for preserving more places for women like New Hall at Cambridge, St John's at Cambridge, and St Hilda's and Somerville at Oxford, would combine elements of both strands.

For men's colleges the questions are how long to hold out, is there a distinctly male-orientated candidate, the beer-drinking prop forward, will applications hold up. For women's colleges the questions are more critical: what to do about falling applications, what to do about the lack of sufficient women fellows in certain fields, particularly science; can one hold out.

The single-sex women's colleges are clearly suffering the most. As the students' alternative prospectus at Oxford puts it, "Co-residential at Oxford can best be described as popular." Fewer and fewer women want to go to single sex colleges. But the arguments are not

straight forward. Both Newnham, Cambridge and Somerville, Oxford, feel they have a responsibility in some way to remain women's colleges, as they were set up. Both have debated the matter in recent years and decided to remain as they are. They point particularly to the lack of women fellows appointed by former men's colleges which are now mixed, on areas they feel a new role has to be played.

Trinity, Cambridge, has one female fellow and one female lecturer out of 120. King's has four out of 80. They point to the appointment of a male head of Lully Margaret Hall, Oxford, and ask why will there be a Mistress of Balliol. Not enough attention has been paid to the career structure of women, the problems of marriage, mobility and children.

Interestingly also, a controversial conclusion from a research project carried out by a Cambridge student last year was that women at mixed colleges suffered significantly more stress than those in single sex colleges. The finding though is disputed and a more usual undergraduate view, in this case from a student from Newnham, was that her life would have been no different if Newnham had been mixed.

'The pick of the men' for New Hall's new element

New Hall was founded in 1954—it celebrated its silver jubilee with an open day in July—with the explicit aim of increasing the number of places for women at Cambridge. The college has remained true to its Charter and never entertained real doubts about "going mixed".

The college planted its standard in a six-acre site on Huntingdon Road at a time when the sex ratio of Cambridge was 12:1 against women and when there were only two other women's colleges, Girton and Newnham.

New Hall began with just 16 founder-undergraduates, one tutor/head Miss (later Dame) Rosemary Murray who went on to become Cambridge's first woman vice-chancellor, and one lecturer, Miss Hope Haumond.

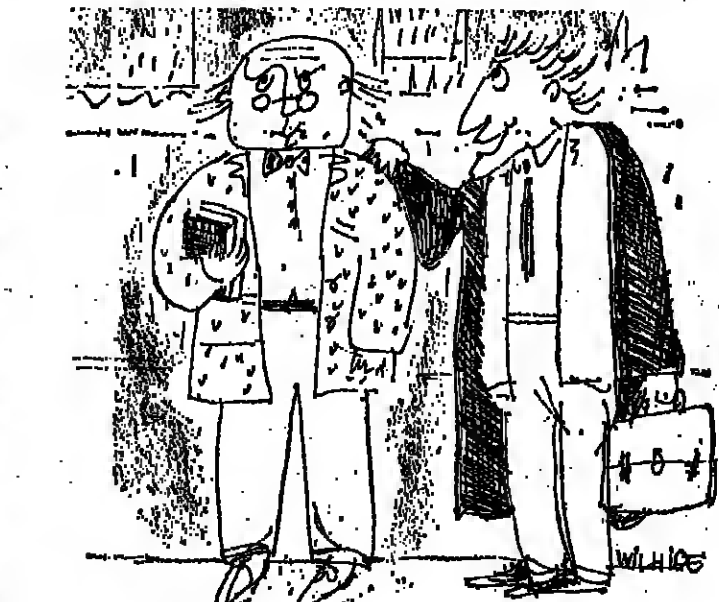
Although New Hall was "accepted" into university within its first year or two, it did not formally become a college until 1972, when the necessary building requirements were complete.

But while the college has no intention of going "mixed", it has nevertheless felt the heat from other colleges in Cambridge doing so. The most significant effect has been a drop of about 20 per cent in applications over the last two years (the exact figures remain confidential).

Dr Kate Pretty, the college admissions tutor, who went to New Hall herself, said the drop in applications had little or no effect on the standards of the college intake, in part because of the university's system of pooling candidates so that potentially bright students rejected by one college can be taken on by another college.

There is a clear bias among new undergraduates against single-sex colleges, but as Dr Pretty points out there are several strong arguments in favour of not going "mixed". There has never been conclusive evidence that men and women should live out of each other's pockets, as said. Women at New Hall are less isolated than women at mixed colleges, they can come back and relax in a friendly atmosphere. As one undergraduate quoted in the alternative prospectus put it: "Although college life tends to be outside college, New Hall, is definitely home."

By all accounts the college has a lively caring atmosphere, giving the unique impression that it is run "for the students", to quote the alternative prospectus again. There are other advantages. The 280 undergraduates are less numerous, and according to Dr Pretty, "have the pick of the men in the university, as opposed to just a college."



Cheer up, old chap. Just think of the Norggrinton Table.

How the Franks figures were surpassed

In 1920 when women were first admitted to matriculation at Oxford, the figures (undergraduate) at the university were women. More than 40 years later the figure had actually declined to about 16 per cent. It was against this background that the Franks Report recommended in 1966 that the proportion of women should be increased to rather over 20 per cent by the 1980s.

That at least is one forecast that has been easily surpassed. This year 983 women will go up to Oxford out of 2,814 undergraduates (34 per cent), a figure not far below the national average of 37 per cent of women at other British universities.

The dramatic increase in this proportion of women at Oxford is almost entirely due to the headlong rush of colleges to "go mixed" last October. Oxford approached the question of co-residence systematically, as one would expect, at the start of the last decade and after much agonising, decided that in 1972 "go mixed" for an experimental period of five years, the so-called Jesus plan.

This, it was argued, would prove the interests of the five women's colleges who were worried about possible repercussions on their admissions, and the five men's colleges who were worried about the loss of their male students. At first the five colleges—Jesus, Wadham, Jesus, St Catherine's and Hertford—operated a quota of about 20 per cent for women. This was dropped

when it was found to fall foul of the Sex Discrimination Act introduced in 1976.

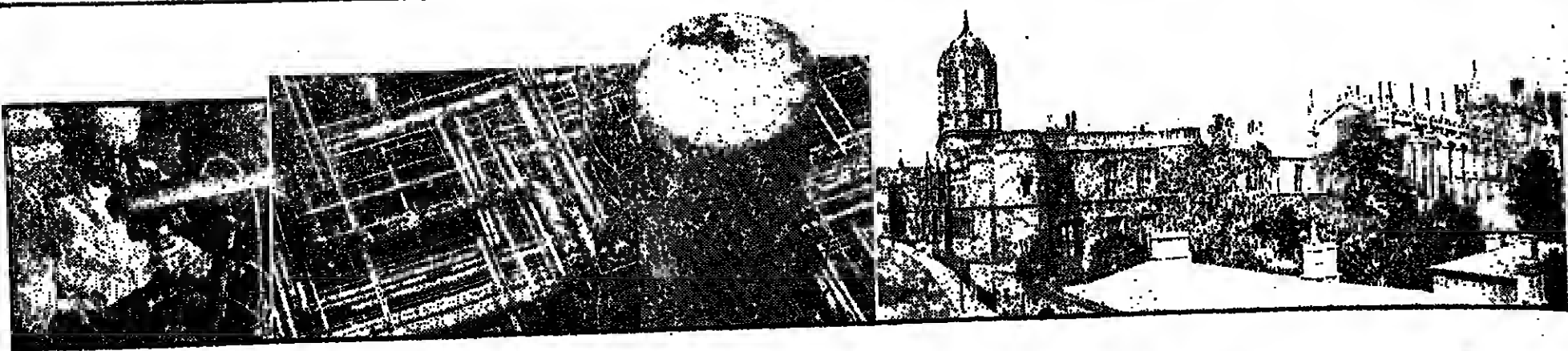
The arguments and doubts of the time (it was 600 years before Oxford accepted its first women's colleges in 1879, Somerville and Lady Margaret Hall) are well illustrated by the form of the debate in the Balliol senior common room. With a reputation as a liberal college Balliol naturally had a strong lobby in favour of going mixed. But though it changed its statutes to admit women, it voted to hold back until it had appointed its first woman fellow.

This was particularly ironic as Balliol had agreed to remove the first female fellow co-residence back in October 1967 when it agreed to share its graduate centre at Holywell Manor with graduates from St Anne's.

But when after five years a majority of dons and male and female undergraduates declared the Jesus plan a success, Balliol joined 15 other men's colleges in what was described as a "stampede" to "go mixed". They were joined by two of the five women's colleges, St Anne's and Lady Margaret Hall. This year Christchurch and Marton will also admit women, leaving only four single-sex colleges at Oxford: Oriel, the last men-only bastion, and St Hilda's, St Hugh's, and Somerville admitting only women.

Between 1978 and 1979 the number of applicants to St Hugh's fell by 26 per cent, St Hilda's by 37

JOHN COLE



Time for an Industrial Research Council

Colin Gallagher argues that there should be a national body to look after the university-based research needs of industry

How strong is the relationship between government sponsored science and the current problems of our manufacturing industry? In particular how does basic scientific research in Britain relate to the needs of industry? The assumption has always been made that there is a strong inter-relationship between science and the process of industrial production which in practice is not valid.

It is important at this point to distinguish between the practice of research which is carried out on the fundamental problems of science in places like universities, and the practice of development work and design work which is carried out principally in manufacturing industry. A number of recent careful and detailed studies have confirmed the unorthodox theory that new science tends to develop from previous science, and new technology from previous technology, and that the cross-linking which takes place is of only marginal importance. Of course the extent of cross-linking will depend to some degree upon the industry type, so in the engineering industries it is small, while in pharmaceuticals it is much more important.

Thus in a study of publications, Price concluded that science builds mostly on earlier science, and technology mostly on earlier technology, and that direct inter-connections between the two were quite rare and Lagrangian in his important study of innovation in British firms came to a similar conclusion. "We have paid particular attention to the relation of basic science to innovation. To our minds, our failure to find more than a small number of direct connections is the more striking for the fact that we set out deliberately to look for them. Our conclusions on this point have proved unpopular in some quarters. Some academic scientists find it difficult to accept what we have already shown: that the great bulk of basic science bears only tenuously if at all on the operations of industry." He concludes that the relationships between science and technology are by no means simple or direct, and suggests that three most important effects of science on industry are —

● Curiosity oriented science in academic institutions provides techniques of investigation.

● Science enters innovation already embodied in technological form, i.e. it helps technology to build on technology.

● It provides to industry people trained in scientific techniques and ways of thought and this is probably its most important influence.

It appears then, that there is little immediate cross-influence between a nation's scientific work and its industrial expertise.

It has been argued chiefly by a number of people that many of the problems of our manufacturing sector are cultural and not technological. One major cultural factor is our confusion of science and technology. We are the only European country which has "technology" subjects, and in particular engineering, as a sub-branch of science, and are definitely inferior to this. No other European country attempts to group together natural scientists and engineers. For example, in Sweden there is no such animal as a "Qualified Scientific Engineer" and it is difficult to see how it could be. Scientists in Sweden just do not hold significant jobs in industry (for example, one survey found only 10 per cent of R & D jobs held by natural scientists, while 75 per cent were engineers).

This lack of grouping of engineers

with scientists was also criticized by Sir John Bunker in his address to the British Association for the Advancement of Science in 1974, but not so in other Western European countries. Yet the two activities, engineering and science, have little in common except the use of all available knowledge, the scientific method, and a secondary syllabus. As a reflection of the confusion in our society on this matter, until as late as 1969, the key Government body concerned with science funding, the Science Research Council had a single committee, its University Science and Technology Board, to cover both basic science and industrially oriented applied engineering research. It was only then that separate Boards were created for science, and engineering.

A considerable amount of research and development work is funded in Britain, both in industry and academic institutions, by such diverse organizations as the Department of Industry, the Requirements Board, the Ministry of Defence, private and state industry and independent trusts such as Nuffield, Leverhulme, and Rowntree.

For universities and polytechnics the most important source of research funds is the state, and these funds are distributed on the recommendations of a special governmental advisory board called the Advisory Board for Research Councils (ABRC). Such research receives what is usually called "dual support" financially, because the institution provides the background facilities and academics time, and the ABRC through its research channels the funding for specific projects.

The Advisory Board for Research Councils' major purpose is to advise the Secretary of State on civil science matters, with particular reference to the allocation of the Science Budget, which is the fund provided by central government for the support of that part of the nation's research work controlled by the research councils. The ABRC is of exceptional importance because of its role in industry, in the type of work which is carried out in the universities, and therefore on the attitudes of their teachers and through them, students.

The seven recipient bodies controlled by the ABRC are shown in Table One, with their 1978-79 financial allocations. Of the total £229m (96 per cent) was directed to research bodies that university post-graduate support, another of the ABRC's important obligations. This can be compared with the £173m spent by the government on all forms of research and development. As a means of comparison with this total, the ABRC research budget was £229m (18 per cent), defence was £276m (50 per cent), and trade, industry and employment £274m (10 per cent).

The major recipient of ABRC funds is the Science Research Council, taking 55 per cent. Of the research councils, it is this one which is of particular importance from the point of view of industry, because it is through it that the majority of industrial money is channelled. The distribution of expenditure of the Science Research Council (SRC) for 1978-79 is shown in Table Two.

One wrong view which comes across from recent ABRC and SRC reports is that much of the expenditure is now for the benefit of industry, and that there has

been a significant swing during the past few years towards industry-oriented research. Since 1974 there has been a policy of redeployment of funds from "big" science (high energy physics, astronomy, space and radio research), towards smaller-scale work. Thus the two UK accelerators have been closed, and the Skylark rocket programme abandoned. There has certainly been a significant move in this direction and this must be recognized. To quote the SRC, "the only major field in which it has been possible to provide for a significant increase of activity has been engineering. The engineering boards' share of total science budget expenditure has increased by about 15 per cent a year over the last three years." In parallel with this, the work of the two big industrial research establishments, Daresbury and Rutherford, which had been largely concerned with high energy physics, has been broadened to include engineering, classical science, astronomy, and space.

Nevertheless, the picture is still one of the Science Research Council dominated by pure science. For example 28 per cent (£41m) of the total SRC budget was earmarked for foreign big science payments before any other allocations were made.

Industry through the Engineering Board at present is only benefiting directly from 17 per cent (£25m) of SRC funds, in contrast with 75 per cent (£108m) being spent on pure science. Of course some of the work carried out under the "science" umbrella channelled its way into industrial exploitation, but as discussed earlier, we should not over-estimate this contribution.

It would be very difficult to assess the overall effect of all of the ABRC expenditure in terms of its benefit to industry, but there is no doubt that the Engineering Board of the Science Research Council is the major channel. Some of the work carried out by the Medical Research Council and

the Social Science Research Council will also make some contribution, but even if we make a allowance for these additional inputs, it is unlikely that more than 13 per cent (£30m) from the total SRC budget of £266m is leaving any short to medium term effect on British industry.

The most recent ABRC report recommends that the redeployment away from big science and towards research posts, and the risk of losing a valuable national competence. But given that we have limited national resources, surely it is essential that for the present they are spent in a way which will help us out of our present social and economic difficulties?

It also argues that because the councils have been unable to provide adequate support for university-based research, many good applicants have been refused research posts, and that as a result some young scientists have not been attracted into research, and an important part of a whole generation lost to science. But surely this loss by one sector of our society is perhaps to the benefit of others? It could equally be argued that these bright young scientists are desperately needed in our manufacturing industries, and that if that is where they have gone, then the policy is succeeding.

A case is put forward in the report that further redeployment away from big science will have even more adverse repercussions in that British industry will lose the chance of gaining experience with new technologies. This surely would be a very expensive way to generate experience for a minute sector of British industry.

Membership of the advisory board is made up of eminent scientists, most of whom have academic or governmental posts, and it is also industrial representatives, although some of the board's justification of its funds is based on the benefits to industry. Perhaps there is a case for increasing the number

TABLE ONE
Research bodies controlled by the Advisory Board for Research Councils, and their 1978-79 allocations

	£ (million)	%
Agricultural Research Council	24	10
Medical Research Council	44	19
National Environmental Research Council	30	13
Science Research Council	146	63
Social Science Research Council	11	5
Natural History Museum	4	2
Royal Society	2	1
Total	266	100

TABLE TWO
Estimated Science Research Council Expenditure 1978-79

	£ (million)	%
Engineering Research Postgraduate	17	7
Physics, Astronomy, and General Science Research (Home)	64	25
Nuclear Astronomy in the form of foreign payments	31	13
Postgraduate	13	6
Other General Expenditure	108	75
Administration	5	2
Central facilities	5	2
Other costs	2	1
Total	146	100

* Total of £224m allocated according to 1977-78 ratio.

of board members who have had significant industrial experience. If as a society we consider it important to support fundamental scientific research (and I personally think it is essential that we do) then we should not delude ourselves that it is of major short-term benefit to our industry. It can be justified on two counts: first, as part of the culture of our society based on a desire to understand the world around us. Second, and of far importance from the point of view of science, but of more importance to industry, it can supply for industry, manpower trained in the techniques of science.

There is an essential role for basic science in British society, but it should neither be confused with, nor principally justified in terms of the needs of the industrial sector of the economy. The justification of it will support of basic science is well expressed by the ABRC itself, "the exploration of man's natural and social environment and of mankind itself is an essential part of intellectual and cultural activity, and that 'scientific research as such' is a sufficiently high." It can in addition have a spin-off for material progress and human welfare, but that should not be its justification in the long term. It must be to the benefit of basic science in order, because our basic science can only flourish on the wealth that is generated by our industry. And though it is, some control of pure science research has had to take place, and our industry and commerce are generating such surpluses.

It would be to the benefit of British science and technology in Britain to have two research institutes for those two essential activities separated. Just as there is a Medical Research Council, so a National Research Council, or a National Research Council, should be set up to properly look after the university-based research needs of industry. We should need ourselves that by supporting science we are supporting industry in any major way, as the approach to the benefit of our industry be argued is sponsored from other sources, such as the Requirements Board or Industry itself. But such sources exist, but they do not provide the elite focus through which universities and research establishments concentrate their efforts. An industrial Research Council would provide such a focus.

A bill has recently been introduced before the American Congress to create a National Technology Foundation to fund research from their existing National Science Foundation. The bill would establish a new research body, the National Technology Foundation, which would be responsible for funding research in the United States carried out by the House Subcommittee on Science, Research, and Technology. The idea is to consolidate some of the important technology-related programmes now scattered throughout the Executive Branch. The bill is for creating the new foundation is that, "hereafter, there has been inadequate recognition of engineering and technology as a major potential contribution of our nation. In the federal government, engineering has been dominated by science and, as a result, the engineering community has been largely ignored. It is the purpose of this bill to create a new foundation for engineering research and development, to be known as the National Technology Foundation."

The author is head of the department of Industrial Management at Newcastle University.

Liam Hudson reflects on the complex creature that is a university

The octopus, the telephone exchange, and the ivory tower

Twenty-six years ago, when I first became an undergraduate, I found the curriculum for the first year of the science component of the degree programme "Sir", the great British universities were still sustaining themselves on Saltaire-Beuve's beautiful image of the tower of Babel. Like any successful metaphor, the notion of an ivory tower is ambiguous. It can mean the idea of whiteness, symbolising purity. It reminds us of ivory, itself, precious but of no very great practical use. The tower from which the tower is carved, rhinoceros or elephant, carries with it thoughts of masculine potency, even of aphrodisiacs; but also the whiteness of death, the tusk as a symbol of death, and the death, too, of the creature from whom the tusk was wrested. A tower suggests a privileged vantage point; but also the idea of fortification, of battlements that separate inside from out. A little further afield, there are even joking, punning associations, too: for example, with the Tower of Babel.

As a metaphor, the ivory tower has a great deal to recommend it. It enabled students and teachers to see their dealings with one another as though they were part of a poem. All that has collapsed though. Apart from one or two admirable institutes for advanced study like the one in Princeton, there are no ivory towers left. Somewhere in the late 1950s or early 1960s, we ditched the metaphor of the ivory tower and drew instead on the metaphors of technology. Universities became factories for producing the skills that the wider society needs: trained doctors, lawyers, technologists, physicists, and computer scientists. In a new mood of rationality, the university became an apparatus responsive to the needs of the society whose doors it opened.

Looking back, it is easy to dismiss all such notions of rationality and responsiveness as humbug; as a convenient fiction that justified the massive expansion of the universities in the late 1960s and early 1970s. In the fields of physical science and engineering, "huge numbers of distinguished physicists, chemists and engineers, stood their ground in half empty laboratories, and convinced by every means in their power to make the half empty seem full. Or, alternatively, they discovered a new responsibility of the state, which was to underwrite the costs of their research, and then to fill the gap with students from the Middle East, who answer in kind with grateful, if Arabic.

What happens instead when a market is glutted? When, for example, there are more social scientists flowing out of the universities than there are jobs for social scientists to fill? Do we cut back each department, producing not thirty a year, say, but fifteen, or keep numbers up, because that way departmental growth lies: the new lecture halls that give the old place life. And we conceive of social sciences as more generally unproductive, as the Classics were once, and so, if I were to tell my students that, in the national interest, they need to study chemistry, or physics, or biology, or for whatever reason, they would be going off to the university, psychology.

What happens when a government body that something for instance, that medical students all mature of anxieties and psychological complications, rather than as meaty disciplines or places of learning and life? We accept the additional funding, and gloriate the great university, and serve the problem of the medical students about people's lives, and the state, the proportion

that there should be space in the medical students' curriculum for a behavioural science component; and then into the reality of already over-loaded medical students being given lectures about the jactant behaviour of the herring gull.

The truth is unmistakable, I think: universities are neither ivory towers nor factories for the production of society's personnel skills; they are institutions. In many ways they most closely resemble the civil service. They give tenure for life to young men and women in their early twenties; they enable us to rise interminably on committees, all of which have valuable sounding functions; and they even allow students to enter into trade union-like negotiations with their examiners about the ways in which their work is judged. This issue of appeals procedures is typical of so much about universities. We create them in the first place because they seem fair but what we create in practice are new dramaturgical possibilities, new roles: a role for the unhappy student as litigator; a role as a witness in best courtroom drama style; for the representative from the student's union; and all manner of roles for lecturers and professors who have grown bored with their own scholarship.

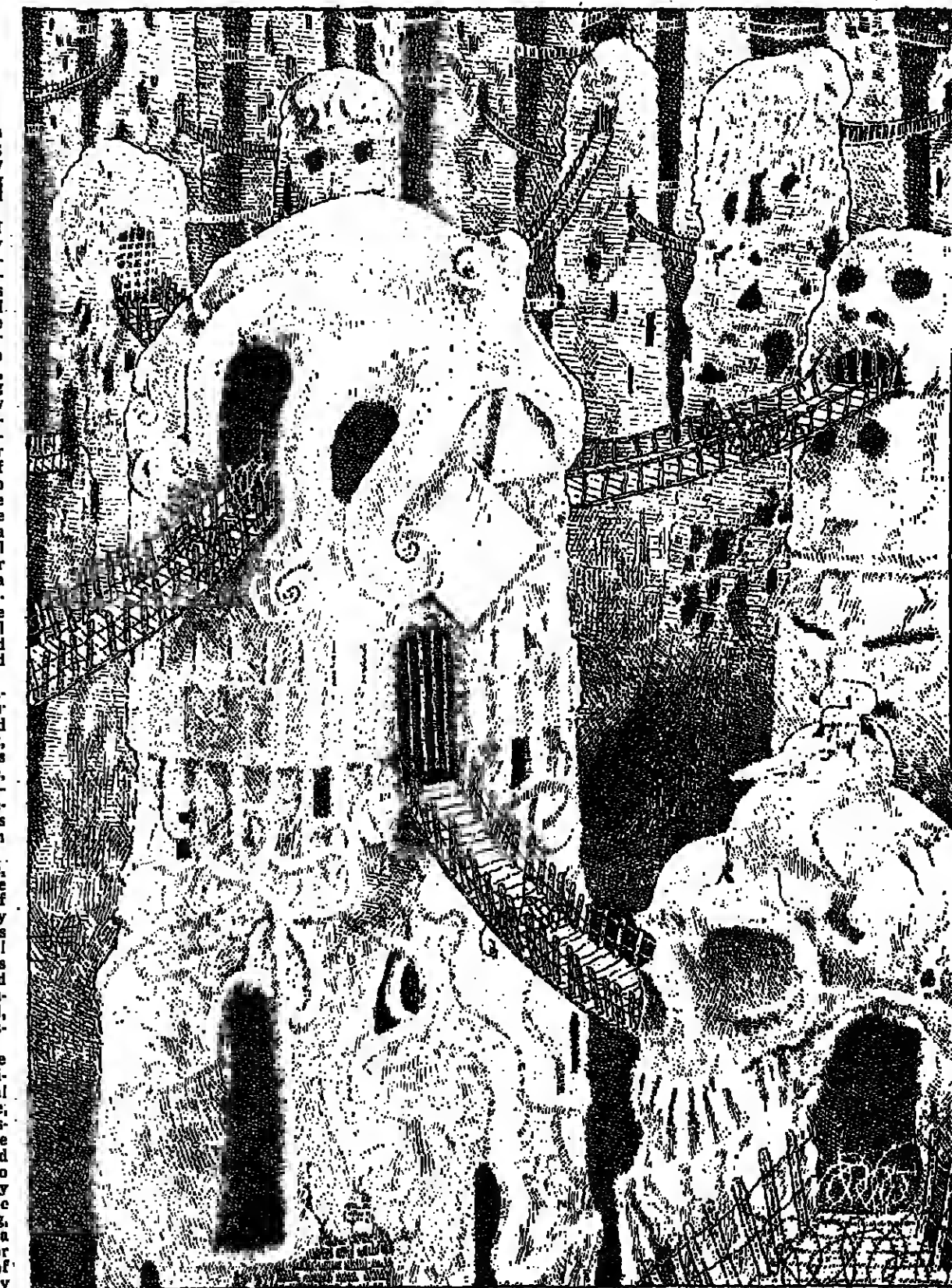
First, we work to set the machinery up like the one in Princeton, months trying to make it work and then, immeasurably more difficult, finding that it generates endless mischief in the guise of justice, we try to take it to bits again. Immeasurably more difficult because any sensible change removes roles from those hungry to go on playing them.

All this is anathema, of course, to those who still believe in the university's declared objectives of teaching and research. They enjoy the deep and genuine consolations of personal affection and personal loyalty. But, like liner passengers in some uneasy dream, they find themselves wrapped within institutions that are primarily dedicated, as all institutions are, to the regulation of their own affairs.

A conventional response to the phenomenon of the university-as-institution is to muse on its social function and to see it, for instance, as a social mechanism for disguising unemployment or as a device by which society involves us with and secures its young whom it can no longer bring itself to live by inherited privilege alone. More searchingly, it is worth noticing, too, that universities establish a sense of downward mobility or social dislocation in the way that those who pass through them, the afford a glimpse from the ivory tower, and then banish us from the centre towards the periphery, where thoughts of poetry and prestige are less to be found. In the process, they set in being the forces of cosmopolitan centre poised against provincial periphery, on which, perhaps, the creative life of any society depends. They may also do grave harm, both to sections of society and to individuals.

More cynically, we could settle for universities as trailing grounds for life in other institutions: the civil service, the health service, the law, the armed forces, the police. But I have a practical suggestion to make: that we treat the university as a natural experiment in institutional life; institutional both in the way they run themselves and in the way they manage the bodies of knowledge they transmit. They give us the chance to think about thought in ways that have direct practical significance, an option that professional philosophers and psychologists have so far failed to exercise.

It seems to me that the interior life of a university poses three deep conceptual problems—three respects in which the apparently straightforward proves, on inspection, to be murky. The first concerns the category around which all research is organised, and routine administration in a conventional university



is organized: that of the subject or discipline.

What on earth is a discipline? Our instinct is to point to examples: chemistry, history, psychology. Presumably, in some order, we edge towards the idea of an undergraduate curriculum, a textbook. Chemistry is what chemistry students are taught at university, it is what a chemistry textbook contains. But this is a little like defining intelligence in terms of what intelligence tests test, it has an unpleasant air of circularity about it. When we talk of chemistry, we gesture, I think, towards an intellectual structure or framework that lies behind all curriculum or textbook, and in terms of which such products can be judged. But as far as I know, no such explicit and articulated framework does underlie chemistry. Rather, it is an assemblage of topics that chemists themselves perceive intuitively as cognate. Certainly, there is no such framework in my own subject, psychology. Yet its absence in no way prevents us from identifying ourselves as psychologists or from claiming, with heat and emphasis, that certain topics are central to our discipline and others not.

In a discipline, then, a species of historical trace: a record of journeys into the unknown that previous generations of pioneers have made. No, I do not think it can be. Or, if it is, it is one that we use to a strangely unhistorical fashion. In psychology, notions of discipline are more like vague sketch maps: not of where a castle is, but of how a castle might in principle be built. What is more, they are persuasive. They are attempts to establish the plan for one sort of castle at the expense of others; to say "this is the way it must be". Thus, when an undergraduate at Oxford, I was taught by brilliant and frightening men that the foundations of psychology lay not in the study of the human brain or human imagination, but in the study of human beings at all, but in the study of the octopus. Specifically, I was persuaded that what a real psychology was, the question of whether an octopus could tell a triangle from a square.

But "plans", "castles"? Is the architectural analogy really apt? Are we in a position to concede that psychology is an edifice that can be built by piecing together sound and carefully selected knowledge, or is it another? My suspicion is that we need a different model altogether: one in which psychology is conceived not as an edifice but as a space—bounded, or partially bounded, by what a heart or a brain is to all intents and purposes a void.

What defines the space, positively, is the concern with what goes on inside the human head: what previous generations of pioneers have made. No, I do not think it can be. Or, if it is, it is one that we use to a strangely unhistorical fashion. In psychology, notions of discipline are more like vague

behaviour, anthropology, ecology, history, psychiatry, philosophy, machine intelligence, cybernetics, and so on. In practice, then, psychology is a discipline defined in a series of border wars, in which the home team fight off the depredations of the sociologists here, the biologists there, a skirmishing that creates boundaries, which, in their turn, must be patrolled.

This view of a discipline clearly has implications. The first is that the real excitement lies at the boundary, not in the heartland, around the edge of the space, not in the middle. The second is that such a discipline will tend to be polyglot: those facing one particular part of the boundary having much more in common, intellectually, with outsiders who work "just on the far side of it" than they do with other insiders whose energies are addressed elsewhere. Further, the space is one that invites affirmative ritual, that creates an appetite for the rehearsal of orthodox practices and orthodox beliefs. This finds its most obvious expressions in the undergraduate curriculum and the standard journal articles, neither of which exposes participants to the risks of significant discovery and both of which demand movements of the mind that are, in essence, courtly.

From this first conceptual awkwardness, the apparently indeterminate or arbitrary nature of our assumptions about disciplines. How

Continued on page 12

John C. H. 116

BOOKS

Scheme of things geographical

کتاب فی الفی

BOOKS

Cinderella of the energy industries

The Evolution of the Gas Industry
by M. W. H. Peabody
Macmillan, £12.00
ISBN 0 333 27971 9

Energy is a fashionable subject among historians. Recent years have seen the appearance of a growing number of books and articles dealing with aspects of the development of the energy industries both in Britain and overseas. In Britain major "official" studies of electricity, coal and atomic energy are underway, while a list of other scholarly works appearing recently on these and related subjects would be a lengthy one. Gas, however, is something of a Cinderella subject. There exists no satisfactory account of the history of the industry in Britain, although several studies are in progress, while in English the growth of the industry abroad.

The neglect of gas has left a major gap not only for those interested in the history of the energy industries, but for those concerned with industrial and technological development generally. There are many reasons for studying the evolution of gas. Gas, established first in Britain at the opening of the nineteenth century, was the earliest important manufacturing industry to be based on joint-stock organization, and it was one of the first industries to have a significant role in modern science.

Gas was at first used almost exclusively for lighting, and marked a major improvement over existing illuminants. During the second half of the nineteenth century technical developments cheapened the cost of gas and improved the product, and this stimulated new outlets for gas in heating, cooking, and in power generation, especially when competition from electricity started to appear. Significant markets, such as the coal-gas distillation, commenced after 1850 and in the present century this became the basis of the gas industry.

British enterprise and capital were in the forefront of gas production abroad. The industry progressed, so questions of government regulation and municipalization emerged. In the present century competition from electricity and oil has further pushed the uses for gas into new channels, while nationalization and the development of oil and natural gas have revealed the structure and technology of the industry.

Even such a brief and incomplete sketch shows the evolution of gas to be a subject of considerable importance to the history of the industrial and technological development generally. There are many reasons for studying the evolution of gas. Gas, established first in Britain at the opening of the nineteenth century, was the earliest important manufacturing industry to be based on joint-stock organization, and it was one of the first industries to have a significant role in modern science.

The welcome, unfortunately, barely extends beyond the book's opening page. Three major

criticisms must be levelled. First, despite the author's claim that "This book, as the title implies, endeavours to trace and account the evolution of the gas industry from its birth in the early nineteenth century through to the latest date for which statistical and other factual data are currently available", the book is certainly not about the evolution of the industry. Nearly all the text is taken up with the growth of natural gas. Hence it deals almost exclusively with very recent periods, mostly since 1960, and omits nearly all the major developments which took place during the era of coal-gas. This is demonstrated clearly by the 36 tables in the text: 27 cover only the period after 1960, a further eight refer to years after 1945, while only one, on Russia, extends back further, to 1928.

Oddly, the choice of photographs and illustrations does not reflect the same bias. Excluding the chapter on liquefied natural gas (necessarily modern), the few that are included to the years up to about 1900, a further five to the years 1900-1940, and only 18 to the post-1940 period. Thus a casual glance at title, bibliography, and illustrations will give a totally inaccurate impression of what the book is actually about. It may not be alone in depicting the tendency of some publishers to give books attractive general, but highly misleading, titles.

The second criticism concerns the superficiality and inaccuracy of those snippets of history the book

does include. Based apparently on just a few English-language sources, and with no source references, the historical sections of the book are, frankly, unscholarly and unreliable. One passage about the British gas industry will make the point. The author writes (page 8): "Mindcock is reported to have illuminated his house with gas in 1712, and five years later to have installed a gas light outside the door of the Manchester Police Commissioners. This was followed by illuminating the exterior of the Boulton & Watt factory in Birmingham, England, in 1802 and a large cotton mill in Salford, Lancashire, in 1805. Records indicate that the latter cost £600 a year compared with £2,000 a year for candles."

Especially with the literature would have to be the author. The Mindcock probably conducted only the most rudimentary experiments around 1792, and he certainly did not install a light for the Manchester Police Commissioners in 1797 or at any other time. There may here be a confusion with Samuel Clegg, who probably lit such a lamp by gas in 1806; far from illuminating the exterior of the factory, Boulton & Watt seem to have lit just two small gas flares as part of the illuminations to celebrate the Peace of Amiens on one occasion in March 1802, by the year 1805, a shop had had gas lit by gas of Phillips & Lee's factory. The first lighting was not until the year following, and completed only in 1807; while it was estimated at the end of 1807 that

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Catastrophe theory

Introduction to Catastrophe Theory
by P. T. Saunders
Cambridge University Press, £9.50
ISBN 0 521 23042 X and 29782 6

Catastrophe theory has now been around for over a decade, and the past five years have seen significant progress. It is not hard to see why. The most visible and vocal critics alluded, in *The Sciences*, to "one chance in a billion" of applications to physics, and in *Nature* worried that its "spectacular failures" might lead to a general disillusionment with the whole of modern mathematics. Possibly he felt that Newscientist's exaggerated and inaccurate report on the most important development in mathematics since "relativity", as that journal fondly imagined, was being met by equally exaggerated and inaccurate counterclaims; but put matters in perspective, a recent survey of catastrophe theory as applied to optics alone runs to some hundred printed pages.

One cause of the controversy, of course, was the early absence of accessible expositions. Other then technical mathematics, or popular science, now we are offered a text book, of undergraduate level, aimed at science students in general, with slight emphasis on biology. Its extent is modest, as befits its aims, and it is an extremely welcome addition to the literature.

The reader will not find, within these pages, any exhaustive survey of the accomplishments of the theory, by any presentation in depth of the case for or against it. It is an "introduction", content with brief sketches of certain main lines. However, critical analysis is not absent. The author takes the view that the best way to represent a catastrophe theory is to apply it to a given problem is to learn enough about it to try using it, and see what happens. As illustrations he includes epicycloids, non-linear oscillations, and a chapter on dynamical systems (each representative of a discipline with no extensive technical literature), sociology (more tantalizing), and a major source of controversy, though somewhat over-simplified by critics since it is by no means a "theory" of "catastrophe" in the sense of the title. The author's approach is to "attack" the subject from a biological, psychological, and biological point of view. The method is presented and its merits and demerits briefly discussed.

D. C. Williams

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juice in assimilable form, and the author has profited by their endeavours—indeed, added some of his own. In a remarkably short space he conveys the spirit, and some of the technical details, of the main mathematical ideas behind the theory of singularities of real-valued functions—and the nature of the results.

There are a few blemishes: notably, the change of variables on page 110 is not, as stated, a diffeomorphism, it is a "conformal" map, and a corner into a cusp. It is a curious error to make, and it is curious that some doubt on the application (to a predator-prey system) in the appendix. However, and it is a pity, the book is a very good one. It is a pity, the book is a very good one. It is a pity, the book is a very good one.

Ian Stewart

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D. C. Williams

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BOOKS

New world history

Paths to the American Past
by J. R. Pole
Oxford University Press, £11.25
ISBN 0 19 502579 2

Before 1945 British academic interest in the United States was directed towards the politics rather than the history of a nation whose past was thought to be too new to be worthy of study. The path of inquiry, largely marked by Bryce and Brown, barely perceptibly broadened to permit the passage of a few British imperial historians who would, in any event, decline to pre-empt further than the establishment of independence. America remained a land fit for travellers, not scholars. Only after the end of the war did the United States seem to come, though certainly not to all British historians, worth studying, both on its own account and also, through participation in American universities' graduate programmes, as a valuable means of training in methods of research. Private benevolence and public policy provided opportunities, and though it might be said that many were chosen but few felt called to undertake a complete doctoral training in the United States, still, by the late 1950s, British academic awareness of American history and historians had developed out of recognition.

R. Pole, now Rhodes Professor of American History at Oxford, was one of the first students to enjoy this experience in full, and his part

in this significant and novel extension of British historical interest offers special cause for an assessment of this collection of essays, the product of over 20 years spent not simply in watching, but in probing and defining America and the American past.

Written for a variety of audiences and occasions, these essays demonstrate that Professor Pole, though initially a specialist in the colonial period, has not allowed this interest to exclude consideration of the national period. His subjects, therefore, extend over a considerable stretch of time and a number of themes, and must, inevitably, make different appeals to readers.

Papers have not been revised in the light of later contributions, so that one feels that the essay on "Abraham Lincoln and the Working Classes of Britain", dating from 1959, requires more than the one on "The Postscript to the American Revolution" which receives by way of acknowledgement of subsequent studies relating to the topic.

Somewhat differently, the 1962 article on "Historians and the Problem of Early American Democracy" does not, revised, exert its earlier impact. This may be merely a token success, an absorption in a wide range of works that, consciously or otherwise, have employed arguments that once seemed original. It should not be concluded, however, that the earlier essay, the less its value, since the 1958 article on "Representation and Authority in Virginia from the Revolution to Reform" reads as freshly and persuasively as any paper in the volume.

Peter Marshall

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Spokesman of the poor

Travels into the Poor: Mao's Conscience
by Henry Mayhew
Callao Books, £10.00
ISBN 0 904573 25 X

The Morning Chronicle Survey of London and the Poor: The Micro-World of Henry Mayhew
Callao Books, £15.00
ISBN 0 904573 20 6

One of the most expressive of Victorian anecdotal pictures is a canvas by Holman Hunt entitled *The Awakening Conscience*. Peter Quennell has suggested. Perhaps the same theme is conveyed, in a different key, by Henry Mayhew, in these complementary studies. One belongs to the actual survey carried out by the contemporary investigator, the other a twentieth-century critic's analysis of the same era. The conditions of London's labouring and "underground" poor, the latter reflects the reality of the former, both give us a penetrating insight into the life of Victorian London.

Mayhew, according to Professor Humphreys, had the dubious advantage of being a man and an observer. This applies to the two books in this series. The paradoxical reality of a "poor" rebellion is seen in a way that is both effective and, in the end, a little depressing. It is his ability to see the "poor" in a way that is both effective and, in the end, a little depressing. It is his ability to see the "poor" in a way that is both effective and, in the end, a little depressing.

Research work, more than a book, is a good thing. It is a good thing, more than a book, is a good thing. It is a good thing, more than a book, is a good thing. It is a good thing, more than a book, is a good thing.

Ian Stewart

Ian Stewart is lecturer in the Mathematics at Trinity College, Dublin.

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and conflict. At this stage, sectarian tendencies were in the ascendency, and they were reinforced after 1959. Caelel concludes that by the middle of the war most pacifists had realized that pacifism was essentially an apolitical creed which could not easily be translated into prewar group forms. The paradox for the PPU after 1945 has been that pacifism is a matter of individual conscience and unlikely to have great political relevance, yet in an organized form it tends to attract the politically-minded.

Keith Robbins

Keith Robbins is professor of modern history at the University of Glasgow.

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